Remarks:

This application has been reviewed carefully in light of the Office Action mailed October 29, 2008. Claims 16/1 and 16/4 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 1, 4, 5, 6, 9, 11, 12/6, 13/6, 14/6, 15/6, 12/9, 13/9, 14/9, 12/4, 13/4, 14/4, 15/1, 15/4, and 15/11 were rejected under 35 U.S.C. § 102(b), as being anticipated by Yoshinaga et al., U.S. Pat. Num. 4,395,197. Claims 1, 4, 5, 9, 11, 13/9, 14/9, 13/4, 14/4, 15/1, 15/4, and 15/11 were rejected under 35 U.S.C. § 102(b), as being anticipated by Fabri et al., U.S. Pat. Num. 3,824,029. Claims 16/1 and 16/4 were rejected under 35 U.S.C. § 103(a), as being unpatentable over Fabri et al. in view of Trumpler, U.S. Pat. No. 2,471,174.

The above-described rejections are addressed as follows.

I. § 112 Rejection

Claim 16 has now been amended to correct the identified issue. More particularly, the multiple dependency has been removed, and new claim 17 has been added. The applicant respectfully requests the rejection of claim 16 under 35 U.S.C. § 112, be withdrawn.

II. § 102(b) Rejections

A. The Art Fails to Disclose Free-Ended Blades

The present invention pertains to a modification of turbocharger technology for a non-shrouded compressor wheel to resist the reverse flow of fluid through the wheel, such as when faced with significant back pressure. This modification uses a discontinuity in the shroud, the

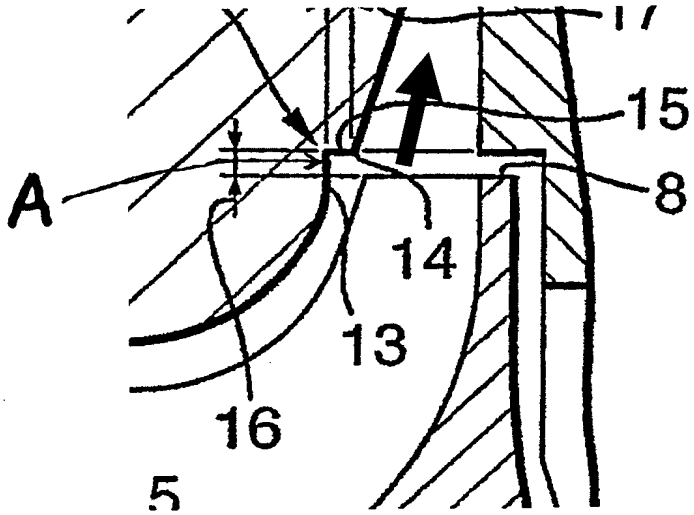
discontinuity being associated with a surface that faces downstream in the gas flow path.

The invention is distinct from the cited art in that each cited reference discloses a shrouded wheel, while claim 1 now recites a compressor wheel having free-ended compressor blades that are characterized by a free-ended outer edge. None of the references disclose both the cited discontinuities and free-ended compressor blades. Because the cited references fail to disclose the features of claim 1, as amended, the applicant respectfully requests the rejections of claims 1, 4-6, 9, and 11-16 be withdrawn.

B. A Downstream Direction Is Relative To Flow Direction

A person skilled in the art understands the term "downstream" to define a direction relative to the local flow in a flow stream. More particularly, at any given location along the length of the flow stream, the downstream direction will be understood by a person skilled in the art as the direction of flow at that longitudinal location along the flow stream.

The direction of downstream needs to be understood in light of the flow. In all of the applicant's figures (including FIG. 2, below), the downstream direction is not vertically upward (with reference to the direction on the page). Rather, while the right-side wall of the diffuser is a vertical line, the left-side wall is a sloped line such that the net flow is up and to the right on the paper (as indicated by the large arrow). Thus, while the blocking face is a vertical line, it is nevertheless facing in the downstream direction, and thereby forms a downstream-facing blocking face (identified with an A). Because the blocking face is angled to face downstream, it impedes fluid from flowing upstream.



Claim 1 recites a discontinuity in the region of the trailing edge, wherein "the discontinuity forms a downstream-facing blocking face adapted to impede an upstream flow of gas between the shroud and the wheel, the blocking face extending across the gas flow path to form a sharp edge connecting the blocking face to a smoothly curving surface along the gas flow path upstream of the discontinuity".

The cited references disclose certain discontinuities on housing walls, but they fail to disclose discontinuities having a downstream-facing blocking face. Moreover, the cited references fail to disclose the blocking face forming a sharp edge connecting the blocking face to a curving surface upstream of the blocking face.

In the figures provided in the Office Action, the identified blocking faces face either across the flow (for Yoshinaga et al.) or upstream (for Fabri et al. – although the arrow in the Office Action's Fabri et al. figure might be pointing to a point on the wall that faces across the flow). Additionally, in each case the associated sharp edge connects the alleged blocking face to a surface that is downstream (rather than upstream) from the blocking face.

Because the cited references fail to disclose these features, the applicant respectfully requests the rejections of claims 1, 4-6, 9, and 11-16 be withdrawn.

C. The Art Fails to Disclose a Discontinuity Across the Gas Flow Path

In each rejection, the asserted discontinuity is located not along the gas flow path through which the compressor blades are rotating to pressurize the air, but rather they are located outside of the rotating shroud, in an area understood in the art to be an area substantially isolated from the gas flow path. Claim 1 recites that the discontinuities are located along the gas flow path through which the blades are rotating. Because the cited references fail to disclose this feature, the applicant respectfully requests the rejections of claims 1, 4-6, 9, and 11-16 be withdrawn.

III. The Elimination of an Element Is Not Obvious In This Case

The applicant notes with appreciation that in the interview, the examiner cautioned that the elimination of an element can be obvious in some cases. While it may be true that the mere omission of an element together with its function does not produce a patentable invention, it may be unobvious to omit an element in other situations. For example, it is an indicia of unobviousness to have an eliminated feature while retaining its function (see, MPEP 2144.04 (II)(B), and In re Edge, 53 C.C.P.A. 1124; 359 F.2d 896; 149 U.S.P.Q. 556 (C.C.P.A. 1966)).

In the present case, the claims have been clarified to recite impeller wheels that have open ended blades rather than blades connected by a rotating outer shroud on the wheel. This is not simply the elimination of an element and its function. A person skilled in the art understands that a shroud functions to efficiently guide air along a gas flow path through which

blades rotate, such that the blades can force the air forward along the gas flow path. In a turbocharger having a shrouded wheel (as shown in all three cited references), this function is carried out solely by the rotating wheel shroud. In a turbocharger having free-ended blades, this function is carried out solely by the portion of the compressor housing that surrounds the wheel. Thus, as was the case in In re Edge, the function of the shroud is maintained in the present claimed invention (albeit by a different element), and thus the present amendment is not simply the elimination of an element and its function.

Moreover, the cited art is being cited for features that are not in the shroud, but rather in the housing that surrounds the shroud. As can be seen by the vast array of turbocharger technology that is published and patented, a person skilled in the art would not change a shrouded wheel to have free-ended blades unless they also reshaped the housing to conform with known shroud technology (i.e., that is smooth). The discontinuities in the cited art are only there to accommodate features of the rotating shroud, and a person skilled in the art would not maintain such discontinuities if the shroud were eliminated.

Thus, it would not be obvious to remove the shrouds of the turbochargers in the cited patents without also removing the housing discontinuities associated with those shrouds.

IV. Conclusion

In view of the foregoing, the applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

Hua CHEN

By: _____

John A. Griecci
Registration No. 39,694
For: The Law Office of John A. Griecci
703 Pier Avenue, Suite B #657
Hermosa Beach, CA 90254
(310) 376-6527

Application Correspondence Address:
Attn: Chris James, Esq.
Honeywell Turbo Technologies
23326 Hawthorne Boulevard, Suite #200
Torrance, CA 90505
(310) 791-7850